



## **TG Engineering Support Task**

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**Oct 23, 2002**

# Background

- **Task started in 1969**
- **Purpose**
  - Provide investigative, engineering, and administrative support to TG of RCC
  - Provide test facilities
  - Help develop standards and standard test methods
- **Funded by TG member organizations**

# Tasks

- **1. Telemetry Band Encroachment** - Collect information, perform required analysis, and provide technical comments on proposals to reallocate existing telemetry bands.
- **2. Modulation Methods** - Investigate modulation methods with increased bandwidth efficiency for use in aeronautical telemetry applications.
- **3. RF Telemetry Measurements** - Determine "critical" characteristics of RF signals and how to measure these characteristics, includes channel characteristics and spectral occupancy.
- **4. Update Telemetry Applications Handbook** - Update Telemetry Applications Handbook to include FQPSK-B discussion, telemetry channel data, and other topics as needed.
- **5. Error Correction Coding** - Investigate error correction coding techniques and their applicability to aerospace telemetry.
- **6. Recorder/Reproducer Committee Support** - Provide engineering support and attend standardization related meetings (Joe Lloyd, NAVAIR-Pax River).

# Telemetry Band Encroachment

- **DARS primary in 2320-2345; WCS primary in 2305-2320; 2345-2360 (TM secondary); WCS starting to provide service**
- **Sirius Radio & XM Radio both providing DARS Services**
- **WorldSpace delayed launch of CARIBSS-1 (AMERISTAR) to concentrate on other ventures;**
- **Luxembourg request for a Global Satellite Radio System in the 1467-1492 MHz band**
- **MSS still interested in 1518-1525 MHz (Regions 1 & 3 /worldwide harmonization); on WRC03 agenda; sharing studies underway, May & September meetings in Geneva**
- **IMT-2000 July 22 report recommends 1710-1755 and 45 MHz from 2110-2170 MHz bands for commercial advanced wireless services in USA; 2385-2395 MHz available for TM???**
- **Requirements for wideband telemetry band between 3 and 30 GHz (WRC05/06, augmentation), meeting in Geneva in May**

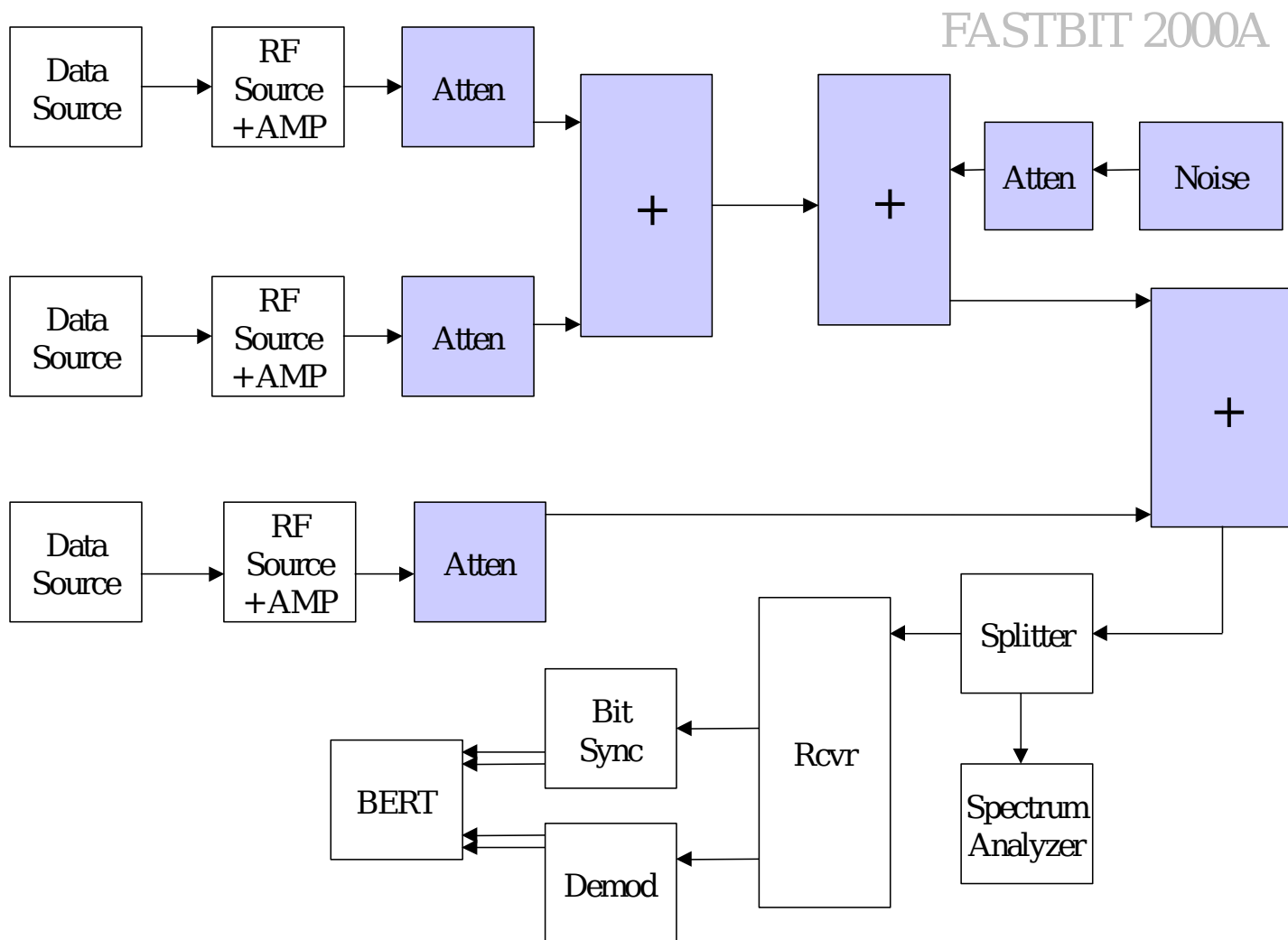
# Modulation methods

- FQPSK-B demodulator test methods published, FQPSK-B transmitters test methods out for pink sheet review
- Propose adding FQPSK-JR, SOQPSK and Multi-h CPM to IRIG 106-03

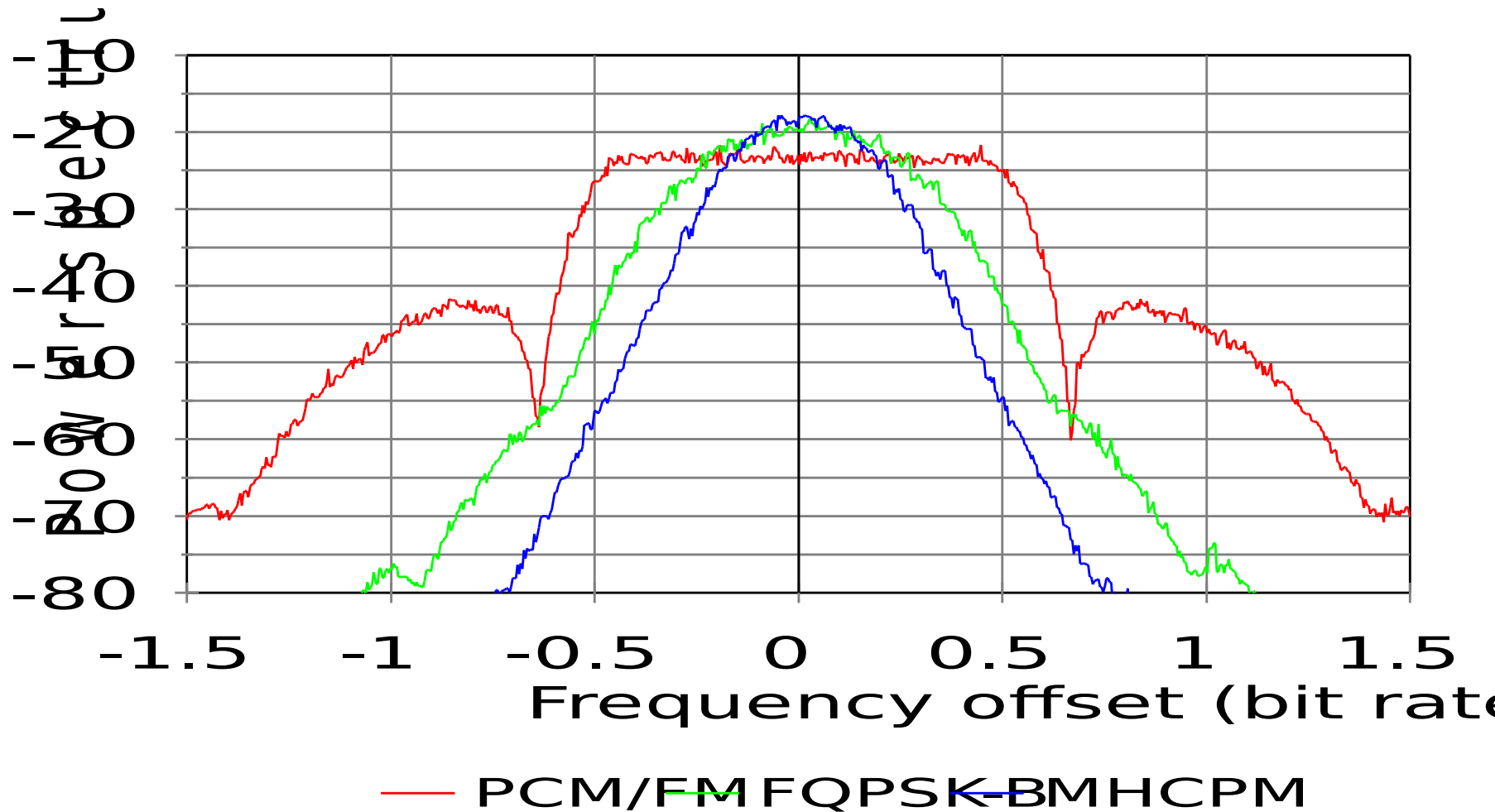
# Update to TM Applications Handbook

- **FQPSK-B + General Quadrature Modulation**
- **Multi-h CPM + SOQPSK**
- **Adjacent Channel Interference**
- **TM Channel Characteristics**
- **Telemetry/GPS Compatibility**
- **Additional spectral information**

# ACI Test Setup

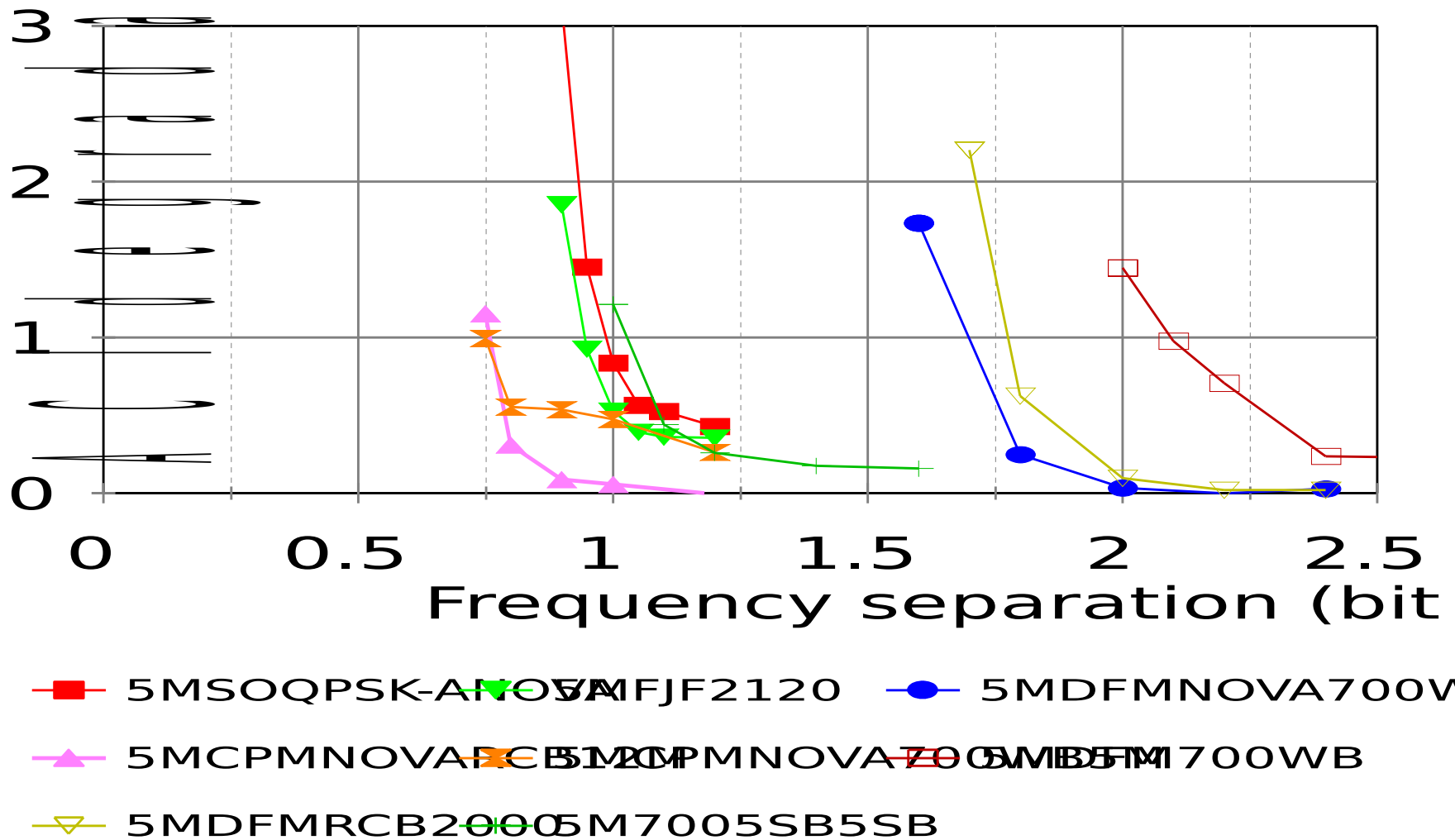


# Spectra for Various Modulation Methods





# ACI Performance Summary



Separations where BEP starts to increase rapidly with closer spacing

